

THE HORN PHOSPHINE GENERATOR AND FUMIGATION METHODS WITH THIS NEW TOOL FOR SPACE, STORED PRODUCTS AND FRUITS

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The Horn Phosphine Generator is an automated device for the rapid production of phosphine gas mixtures in the range from 0 to 1.8% PH_3 . This gas is pumped into the structure through a recirculation fan within the Generator. The Horn Generator can produce over 5000g of phosphine per hour, enough to treat over 250,000 cubic feet.

The Generator weighs approximately 300 pounds and its dimensions are about 2.6 x 2.6 x 3/6 feet high. It is powered by single phase 220V electricity. A small amount of water is required, less than 55 gallons for a one million cubic foot fumigation. From one to two 60 lb. Cylinders of carbon dioxide are required to dispense about 20 kg of phosphine, sufficient to treat one million cubic feet of space.

While the magnesium phosphide product has not yet been registered with EPA and no approved labeling is available, it is anticipated that they will allow the waste slurry to be disposed of directly into storm sewers. When decanted, the solids may be disposed of at landfills, as is the case with other phosphine products. The registration is one the "fast track" at EPA and it is anticipated that from 6 to 10 months will be required.

There are a number of advantages to the horn Phosphine Generator over conventional fumigations with metal phosphide products.

1. Faster introduction of phosphine
2. Recirculation to reach effective levels throughout the storage
3. Add-back without re-entry
4. Tall silos
5. Lower man-hour requirements
6. Mill fumigations in combination with carbon dioxide, high temperatures and low phosphine concentrations
7. Fumigations for rodents
8. Virtually eliminates worker exposure during application

The principle of the Generator is as follows:

The internal plumbing of the Generator is flushed with carbon dioxide to remove air. The Generator is then loaded with a specially-designed magnesium phosphide product. This product, called Magtoxin® Granules, produces one gram of phosphine per two grams of product. You may recall that three grams of Phostoxin® are required to produce one gram of phosphine. Once loaded, the Generator automatically transfers the magnesium phosphide to a reaction chamber where it reacts with water to produce gaseous phosphine. The carbon dioxide/phosphine gas mixture is diluted down to about 1.8% with air taken from the structure being treated. The diluted gas is then injected back into the structure through the recirculation system.

The Generator has been used successfully for the fumigation of tall grain storages, large warehouses, shipholds, and other storage structures. This technique produces lethal concentrations of phosphine throughout the treated structure faster than any procedure in use today.

Results will be presented for fumigation of various storages containing commodities normally treated with phosphine or methyl bromide. Recent results on the use of the Horn Phosphine Generator for fumigation of sensitive commodities such as grapes, grapefruit, and lemons which have hitherto only been treated using methyl bromide.